

Electricity and Magnetism, Ireland, Ireland, NML (National Metrology Laboratory)

Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty					
Quantity	Instrument or artifact	Instrument Type or Method	Minimum value	Maximum value	units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier
DC voltage sources: single values	Solid state voltage standard	Comparison with group of solid state voltage standards	10	10	V			3	µV	2	95%	No	1
DC voltage sources: single values	Solid state voltage standard, standard cell	Potentiometric measurement	1.018	1.018	V			1	µV	2	95%	No	2
DC voltage sources: single values	Solid state voltage standard	Potentiometric measurement	1	1	V			1	µV	2	95%	No	3
DC voltage sources: low values	DC voltage source, multifunction calibrator	Potentiometric measurement	0.1	0.1	V			0.3	µV	2	95%	No	4
DC voltage sources: low values	DC voltage source, multifunction calibrator	Potentiometric measurement	1	1	V			1	µV	2	95%	No	5
DC voltage sources: low values	DC voltage source, multifunction calibrator	Potentiometric measurement	10	10	V			8	µV	2	95%	No	6
DC voltage sources: intermediate values	DC voltage source, multifunction calibrator	Voltage ratio measurement	100	100	V			200	µV	2	95%	No	8
DC voltage sources: intermediate values	DC voltage source, multifunction calibrator	Voltage ratio measurement	1000	1000	V			3	mV	2	95%	No	9
DC voltage sources: low values	DC voltage source, multifunction calibrator, DC voltage: V	Potentiometric measurement	0.01	10	V			Q[0.3, 0.8V], V in volt	µV	2	95%	No	10

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DC voltage sources: intermediate values	DC voltage source, multifunction calibrator	Voltage ratio measurement	10	100	V			2.5	µV/V	2	95%	Yes	11
DC voltage sources: intermediate values	DC voltage source, multifunction calibrator	Voltage ratio measurement	100	1000	V			4	µV/V	2	95%	Yes	12
DC voltage meters: intermediate values	Multimeter	Characterised DC voltage source	0.1	0.1	V			0.5	µV	2	95%	No	13
DC voltage meters: intermediate values	Multimeter	Characterised DC voltage source	1	1	V			2.6	µV	2	95%	No	14
DC voltage meters: intermediate values	Multimeter	Characterised DC voltage source	10	10	V			20	µV	2	95%	No	15
DC voltage meters: intermediate values	Multimeter	Characterised DC voltage source	100	100	V			280	µV	2	95%	No	16
DC voltage meters: intermediate values	Multimeter	Characterised DC voltage source	1000	1000	V			3.6	mV	2	95%	No	17
DC voltage meters: intermediate values	Multimeter, DC voltage: V	Characterised DC voltage source	0.001	10	V			Q[0.3, 4V], V in volt	µV	2	95%	No	18
DC voltage meters: intermediate values	Multimeter	Characterised DC voltage source	10	100	V			3	µV/V	2	95%	Yes	19

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DC voltage meters: intermediate values	Multimeter	Characterised DC voltage source	100	1000	V			5	µV/V	2	95%	Yes	20
DC resistance standards and sources: low values	Fixed resistor	Substitution measurement	1	1	Ω	Oil temperature	20 °C to 25 °C	0.5	µΩ	2	95%	No	21
						Measurement current	30 mA to 50 mA						
DC resistance standards and sources: intermediate values	Fixed resistor	Substitution measurement	10	10	kΩ	Oil temperature	20 °C to 25 °C	15	mΩ	2	95%	No	22
						Measurement current	0.1 mA						
DC resistance standards and sources: low values	Fixed resistor	Comparison by means of current comparator bridge	0.1	0.1	mΩ	Oil temperature	20 °C to 25 °C	2.5	nΩ	2	95%	No	23
						Measurement current	30 A to 100 A						
DC resistance standards and sources: low values	Fixed resistor	Comparison by means of current comparator bridge	1	1	mΩ	Oil temperature	20 °C to 25 °C	10	nΩ	2	95%	No	24
						Measurement current	10 A to 100 A						
DC resistance standards and sources: low values	Fixed resistor	Comparison by means of current comparator bridge	10	10	mΩ	Oil temperature	20 °C to 25 °C	50	nΩ	2	95%	No	25
						Measurement current	1 A to 10 A						

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DC resistance standards and sources: low values	Fixed resistor	Comparison by means of current comparator bridge	0.1	0.1	Ω	Oil temperature	20 °C to 25 °C	0.2	μΩ	2	95%	No	26
						Measurement current	0.1 A to 1 A						
DC resistance standards and sources: intermediate values	Fixed resistor	Comparison by means of current comparator bridge	10	10	Ω	Oil temperature	20 °C to 25 °C	10	μΩ	2	95%	No	27
						Measurement current	3 mA to 10 mA						
DC resistance standards and sources: intermediate values	Fixed resistor	Comparison by means of current comparator bridge	25	25	Ω	Oil temperature	20 °C to 25 °C	25	μΩ	2	95%	No	28
						Measurement current	1 mA to 3 mA						
DC resistance standards and sources: intermediate values	Fixed resistor	Comparison by means of current comparator bridge	100	100	Ω	Oil temperature	20 °C to 25 °C	0.1	mΩ	2	95%	No	29
						Measurement current	1 mA to 3 mA						
DC resistance standards and sources: intermediate values	Fixed resistor	Comparison by means of current comparator bridge	1	1	kΩ	Oil temperature	20 °C to 25 °C	1.5	mΩ	2	95%	No	30
						Measured current	1 mA						

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DC resistance standards and sources: intermediate values	Fixed resistor	Comparison by means of potentiometric bridge	100	100	kΩ	Air temperature	23 °C	0.3	Ω	2	95%	No	31
						Measurement voltage	5 V to 10 V						
DC resistance standards and sources: intermediate values	Fixed resistor	Comparison by means of potentiometric bridge	1	1	MΩ	Air temperature	23 °C	5	Ω	2	95%	No	32
						Measurement voltage	5 V to 10 V						
DC resistance standards and sources: high values	Fixed resistor	Comparison by means of potentiometric bridge	10	10	MΩ	Air temperature	23 °C	150	Ω	2	95%	No	33
						Measurement voltage	5 V to 10 V						
DC resistance standards and sources: high values	Fixed resistor	Comparison by means of potentiometric bridge	100	100	MΩ	Air temperature	23 °C	2.5	kΩ	2	95%	No	34
						Measurement voltage	5 V to 10 V						
DC resistance standards and sources: high values	Fixed resistor	Series-parallel build-up resistors and substitution measurement	1	1	GΩ	Air temperature	23 °C	80	kΩ	2	95%	No	35
						Measurement voltage	10 V to 1000 V						
DC resistance standards and sources: high values	Fixed resistor	Series-parallel build-up resistors and substitution measurement	10	10	GΩ	Air temperature	23 °C	10	MΩ	2	95%	No	36

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Quantity	Instrument or artifact	Instrument Type or Method	Minimum value	Maximum value	units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier
						Measurement voltage	100 V to 1000 V						
DC resistance standards and sources: high values	Fixed resistor	Series-parallel build-up resistors and substitution measurement	100	100	GΩ	Air temperature	23 °C	500	MΩ	2	95%	No	37
						Measurement voltage	100 V to 1000 V						
DC resistance standards and sources: high values	Fixed resistor	Substitution measurement against a calibrated standard	1	1	TΩ	Air temperature	23 °C	10	GΩ	2	95%	No	38
						Measurement voltage	100 V to 1000 V						
DC resistance standards and sources: low values	Fixed resistor, resistance box: R	Comparison by means of current comparator bridge	0.01	0.1	mΩ	Oil temperature	20 °C to 25 °C	(2 + 50R), R in mΩ	nΩ	2	95%	No	39
						Measurement current	30 A to 100 A						
DC resistance standards and sources: low values	Fixed resistor, resistance box: R	Comparison by means of current comparator bridge	0.1	1	mΩ	Oil temperature	20 °C to 25 °C	(2 + 20R), R in mΩ	nΩ	2	95%	No	40
						Measurement current	10 A to 100 A						
DC resistance standards and sources: low values	Fixed resistor, resistance box: R	Comparison by means of current comparator bridge	1	10	mΩ	Oil temperature	20 °C to 25 °C	(10 + 10R), R in mΩ	nΩ	2	95%	No	41
						Measurement current	1 A to 10 A						

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DC resistance standards and sources: low values	Fixed resistor, resistance box: R	Comparison by means of current comparator bridge	10	100	mΩ	Oil temperature	20 °C to 25 °C	$(25 + 3R), R$ in mΩ	nΩ	2	95%	No	42
						Measurement current	0.1 A to 1 A						
DC resistance standards and sources: low values	Fixed resistor, resistance box: R	Comparison by means of current comparator bridge	0.1	1	Ω	Oil temperature	20 °C to 25 °C	$(0.2 + R), R$ in Ω	μΩ	2	95%	No	43
						Measurement current	30 mA to 100 mA						
DC resistance standards and sources: intermediate values	Fixed resistor, resistance box: R	Comparison by means of current comparator bridge	1	10	Ω	Oil temperature	20 °C to 25 °C	$(1 + R), R$ in Ω	μΩ	2	95%	No	44
						Measurement current	10 mA to 30 mA						
DC resistance standards and sources: intermediate values	Fixed resistor, resistance box: R	Comparison by means of current comparator bridge	10	100	Ω	Oil temperature	20 °C to 25 °C	$(20 + R), R$ in Ω	μΩ	2	95%	No	45
						Measurement current	3 mA to 10 mA						
DC resistance standards and sources: intermediate values	Fixed resistor, resistance box: R	Comparison by means of current comparator bridge	0.1	1	kΩ	Oil temperature	20 °C to 25 °C	$(0.3 + 2R), R$ in kΩ	mΩ	2	95%	No	46
						Measurement current	1 mA to 3 mA						

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DC resistance standards and sources: intermediate values	Fixed resistor, resistance box: R	Comparison by means of potentiometric bridge	1	10	kΩ	Air temperature	23 °C	$(5 + 2R), R$ in kΩ	mΩ	2	95%	No	47
						Measurement voltage	1 V to 10 V						
DC resistance standards and sources: intermediate values	Fixed resistor, resistance box: R	Comparison by means of potentiometric bridge	10	100	kΩ	Air temperature	23 °C	$(20 + 5R), R$ in kΩ	mΩ	2	95%	No	48
						Measurement voltage	5 V to 10 V						
DC resistance standards and sources: intermediate values	Fixed resistor, resistance box: R	Comparison by means of potentiometric bridge	0.1	1	MΩ	Air temperature	23 °C	$(0.2 + 8R), R$ in MΩ	Ω	2	95%	No	49
						Measurement voltage	5 V to 10 V						
DC resistance standards and sources: high values	Fixed resistor, resistance box	Comparison by means of potentiometric bridge	1	10	MΩ	Air temperature	23 °C	20	μΩ/Ω	2	95%	Yes	50
						Measurement voltage	5 V to 10 V						
DC resistance standards and sources: high values	Fixed resistor, resistance box	Comparison by means of potentiometric bridge	10	100	MΩ	Air temperature	23 °C	40	μΩ/Ω	2	95%	Yes	51
						Measurement voltage	5 V to 10 V						
DC resistance standards and sources: high values	Fixed resistor, resistance box	Potentiometric measurement	0.1	1	GΩ	Air temperature	23 °C	200	μΩ/Ω	2	95%	Yes	52
						Measured voltage	10 V to 100 V						

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DC resistance meters: low values	Ohmmeter, resistance bridge, multimeter	Standard resistor	0.1	0.1	mΩ			5	nΩ	2	95%	No	53
DC resistance meters: low values	Ohmmeter, resistance bridge, multimeter	Standard resistor	1	1	mΩ			20	nΩ	2	95%	No	54
DC resistance meters: low values	Ohmmeter, resistance bridge, multimeter	Standard resistor	10	10	mΩ			100	nΩ	2	95%	No	55
DC resistance meters: low values	Ohmmeter, resistance bridge, multimeter	Standard resistor	0.1	0.1	Ω			0.4	μΩ	2	95%	No	56
DC resistance meters: low values	Ohmmeter, resistance bridge, multimeter	Standard resistor	1	1	Ω			2	μΩ	2	95%	No	57
DC resistance meters: intermediate values	Ohmmeter, resistance bridge, multimeter	Standard resistor	10	10	Ω			20	μΩ	2	95%	No	58
DC resistance meters: intermediate values	Ohmmeter, resistance bridge, multimeter	Standard resistor	25	25	Ω			50	μΩ	2	95%	No	59
DC resistance meters: intermediate values	Ohmmeter, resistance bridge, multimeter	Standard resistor	100	100	Ω			0.1	mΩ	2	95%	No	60
DC resistance meters: intermediate values	Ohmmeter, resistance bridge, multimeter	Standard resistor	1	1	kΩ			2	mΩ	2	95%	No	61

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DC resistance meters: intermediate values	Ohmmeter, resistance bridge, multimeter	Standard resistor	10	10	kΩ			20	mΩ	2	95%	No	62
DC resistance meters: intermediate values	Ohmmeter, resistance bridge, multimeter	Standard resistor	100	100	kΩ			0.3	Ω	2	95%	No	63
DC resistance meters: intermediate values	Ohmmeter, resistance bridge, multimeter	Standard resistor	1	1	MΩ			5	Ω	2	95%	No	64
DC resistance meters: intermediate values	Ohmmeter, multimeter	Standard resistor	10	10	MΩ			150	Ω	2	95%	No	65
DC resistance meters: intermediate values	Ohmmeter, multimeter	Standard resistor	100	100	MΩ			4	kΩ	2	95%	No	66
DC resistance meters: intermediate values	Ohmmeter, multimeter	Standard resistor	1	1	GΩ			100	kΩ	2	95%	No	67
DC resistance meters: high values	High resistance meter	Standard resistor	10	10	GΩ			10	MΩ	2	95%	No	68
DC resistance meters: high values	High resistance meter	Standard resistor	100	100	GΩ			500	MΩ	2	95%	No	69
DC resistance meters: high values	High resistance meter	Standard resistor	1	1	TΩ			10	GΩ	2	95%	No	70
DC current sources: low values	Current generator, multifunction calibrator	Voltage drop across a resistor	100	100	μA			2	nA	2	95%	No	71

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DC current sources: intermediate values	Current generator, multifunction calibrator	Voltage drop across a resistor	1	1	mA			10	nA	2	95%	No	72
DC current sources: intermediate values	Current generator, multifunction calibrator	Voltage drop across a resistor	10	10	mA			100	nA	2	95%	No	73
DC current sources: intermediate values	Current generator, multifunction calibrator	Voltage drop across a resistor	100	100	mA			2	µA	2	95%	No	74
DC current sources: intermediate values	Current generator, multifunction calibrator	Voltage drop across a resistor	1	1	A			30	µA	2	95%	No	75
DC current sources: intermediate values	Current generator, multifunction calibrator	Voltage drop across a resistor	10	10	A			500	µA	2	95%	No	76
DC current sources: low values	Current generator	Voltage drop across a resistor	2	20	pA			100	fA	2	95%	No	77
DC current sources: low values	Current generator	Voltage drop across a resistor	20	200	pA			500	fA	2	95%	No	78
DC current sources: low values	Current generator	Voltage drop across a resistor	0.2	2	nA			2	pA	2	95%	No	79
DC current sources: low values	Current generator	Voltage drop across a resistor	2	20	nA			20	pA	2	95%	No	80
DC current sources: low values	Current generator	Voltage drop across a resistor	20	200	nA			100	pA	2	95%	No	81
DC current sources: low values	Current generator: I	Voltage drop across a resistor	0.2	100	µA			(0.2 + 5E-02I), I in µA	nA	2	95%	No	82a

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DC current sources: intermediate values	Current generator: I	Voltage drop across a resistor	100	200	μA			$(0.2 + 5\text{E-}02I)$, I in μA	nA	2	95%	No	82b
DC current sources: intermediate values	Current generator: I	Voltage drop across a resistor	0.1	2	mA			$(2 + 20I)$, I in mA	nA	2	95%	No	83
DC current sources: intermediate values	Current generator: I	Voltage drop across a resistor	2	20	mA			$(20 + 20I)$, I in mA	nA	2	95%	No	84
DC current sources: intermediate values	Current generator: I	Voltage drop across a resistor	20	200	mA			$(200 + 25I)$, I in mA	nA	2	95%	No	85
DC current sources: intermediate values	Current generator: I	Voltage drop across a resistor	0.2	2	A			$(5 + 50I)$, I in A	μA	2	95%	No	86
DC current sources: intermediate values	Current generator: I	Voltage drop across a resistor	2	20	A			$(100 + 75I)$, I in A	μA	2	95%	No	87
DC current sources: high values	Current generator: I	Voltage drop across a resistor	20	100	A			$(2 + 0.1I)$, I in A	mA	2	95%	No	88
DC current meters: low values	Picoammeter, nanoammeter	DC current source	2	20	pA			100	fA	2	95%	No	89
DC current meters: low values	Picoammeter, nanoammeter	DC current source	20	200	pA			500	fA	2	95%	No	90
DC current meters: low values	Picoammeter, nanoammeter	DC current source	0.2	2	nA			2	pA	2	95%	No	91
DC current meters: low values	Picoammeter, nanoammeter	DC current source	2	20	nA			20	pA	2	95%	No	92

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DC current meters: low values	Picoammeter, nanoammeter	DC current source	20	200	nA			100	pA	2	95%	No	93
DC current meters: low values	Ammeter, multimeter; current I	DC current source	0.2	100	μA			$(0.2 + 5\text{E}-02I)$, I in μA	nA	2	95%	No	94a
DC current meters: intermediate values	Ammeter, multimeter; current I	DC current source	100	200	μA			$(0.2 + 5\text{E}-02I)$, I in μA	nA	2	95%	No	94b
DC current meters: intermediate values	Ammeter, multimeter; current I	DC current source	0.2	2	mA			$(2 + 20I)$, I in mA	nA	2	95%	No	95
DC current meters: intermediate values	Ammeter, multimeter; current I	DC current source	2	20	mA			$(20 + 20I)$, I in mA	nA	2	95%	No	96
DC current meters: intermediate values	Ammeter, multimeter; current I	DC current source	20	200	mA			$(200 + 25I)$, I in mA	nA	2	95%	No	97
DC current meters: intermediate values	Ammeter, multimeter; current I	DC current source	0.2	2	A			$(5 + 50I)$, I in A	μA	2	95%	No	98
DC current meters: intermediate values	Ammeter, multimeter; current I	DC current source	2	20	A			$(100 + 75I)$, I in A	μA	2	95%	No	99
Capacitance: capacitance for low loss capacitors	Standard capacitor	Substitution measurement	10	10	pF	Frequency	1 kHz	100	aF	2	95%	No	100
Capacitance: capacitance for low loss capacitors	Standard capacitor	Substitution measurement	10	10	pF	Frequency	0.1 kHz to 10 kHz	500	aF	2	95%	No	101

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Capacitance: capacitance for low loss capacitors	Standard capacitor	Substitution measurement	100	100	pF	Frequency	1 kHz	200	aF	2	95%	No	102
Capacitance: capacitance for low loss capacitors	Standard capacitor	Substitution measurement	100	100	pF	Frequency	0.1 kHz to 10 kHz	3	fF	2	95%	No	103
Capacitance: capacitance for low loss capacitors	Standard capacitor	Substitution measurement	1	1	nF	Frequency	1 kHz	10	fF	2	95%	No	104
Capacitance: capacitance for low loss capacitors	Standard capacitor	Substitution measurement	1	1	nF	Frequency	0.1 kHz to 10 kHz	50	fF	2	95%	No	105
Capacitance: capacitance for dielectric capacitor	Standard capacitor	AC bridge measurement	10	10	nF	Frequency	1 kHz	200	fF	2	95%	No	106
Capacitance: capacitance for low loss capacitors	Standard capacitor, decade capacitance box	AC bridge measurement	0.1	10	nF	Frequency f	0.1 kHz to 100 kHz	$(50 + 2f^2)$, f in kHz	$\mu\text{F/F}$	2	95%	Yes	107a
Capacitance: capacitance for dielectric capacitor	Standard capacitor, decade capacitance box	AC bridge measurement	0.1	10	nF	Frequency f	0.1 kHz to 100 kHz	$(50 + 2f^2)$, f in kHz	$\mu\text{F/F}$	2	95%	Yes	107b
Capacitance: capacitance for dielectric capacitor	Standard capacitor	AC bridge measurement	100	100	nF	Frequency	1 kHz	2	pF	2	95%	No	108
Capacitance: capacitance for dielectric capacitor	Standard capacitor, decade capacitance box	AC bridge measurement	10	100	nF	Frequency f	0.1 kHz to 100 kHz	$(70 + 2f^2)$, f in kHz	$\mu\text{F/F}$	2	95%	Yes	109

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Capacitance: capacitance for dielectric capacitor	Standard capacitor	AC bridge measurement	1	1	µF	Frequency	1 kHz	200	pF	2	95%	No	110
Capacitance: capacitance for dielectric capacitor	Standard capacitor, decade capacitance box	AC bridge measurement	0.1	1	µF	Frequency f	0.1 kHz to 100 kHz	$(200 + 2f^2), f \text{ in kHz}$	µF/F	2	95%	Yes	111
Capacitance: meters	Capacitance meter	Decade capacitor	0.1	100	nF	Frequency f	0.1 kHz to 10 kHz	$(100 + 2f^2), f \text{ in kHz}$	µF/F	2	95%	Yes	112
Capacitance: meters	Capacitance meter	Decade capacitor	0.1	1	µF	Frequency f	0.1 kHz to 10 kHz	$(300 + 2f^2), f \text{ in kHz}$	µF/F	2	95%	Yes	113
Capacitance: capacitance for dielectric capacitor	Standard capacitor	Substitution measurement	1	1	pF	Frequency	1 MHz	3	mF/F	2	95%	Yes	114
Capacitance: capacitance for dielectric capacitor	Standard capacitor	Substitution measurement	1	1	pF	Frequency	10 MHz	12	mF/F	2	95%	Yes	115
Capacitance: capacitance for dielectric capacitor	Standard capacitor	Substitution measurement	10	10	pF	Frequency	1 MHz	0.5	mF/F	2	95%	Yes	116
Capacitance: capacitance for dielectric capacitor	Standard capacitor	Substitution measurement	10	10	pF	Frequency	10 MHz	3.5	mF/F	2	95%	Yes	117
Capacitance: capacitance for dielectric capacitor	Standard capacitor	Substitution measurement	100	100	pF	Frequency	1 MHz	0.5	mF/F	2	95%	Yes	118
Capacitance: capacitance for dielectric capacitor	Standard capacitor	Substitution measurement	100	100	pF	Frequency	10 MHz	3	mF/F	2	95%	Yes	119

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty					
Quantity	Instrument or artifact	Instrument Type or Method	Minimum value	Maximum value	units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier
Capacitance: capacitance for dielectric capacitor	Standard capacitor	Substitution measurement	1000	1000	pF	Frequency	1 MHz	0.5	mF/F	2	95%	Yes	120
Capacitance: capacitance for dielectric capacitor	Standard capacitor	Substitution measurement	1000	1000	pF	Frequency	10 MHz	7	mF/F	2	95%	Yes	121
Inductance: self inductance, low values	Standard inductor	Substitution measurement	100	100	µH	Frequency	1 kHz	0.5	mH/H	2	95%	Yes	122
Inductance: self inductance, intermediate values	Standard inductor	Substitution measurement	1	1	mH	Frequency	1 kHz	0.1	mH/H	2	95%	Yes	123
Inductance: self inductance, intermediate values	Standard inductor	Substitution measurement	10	10	mH	Frequency	1 kHz	0.5	mH/H	2	95%	Yes	124
Inductance: self inductance, intermediate values	Standard inductor	Substitution measurement	100	100	mH	Frequency	1 kHz	0.5	mH/H	2	95%	Yes	125
Inductance: self inductance, intermediate values	Standard inductor	Substitution measurement	1	1	H	Frequency	1 kHz	0.8	mH/H	2	95%	Yes	126
Inductance: self inductance, high values	Standard inductor	Substitution measurement	10	10	H	Frequency	1 kHz	1.2	mH/H	2	95%	Yes	127
Inductance: self inductance, low values	Decade inductance box	Inductance meter	0.1	1000	µH	Frequency	1 kHz	1	mH/H	2	95%	Yes	128a
Inductance: self inductance, intermediate values	Decade inductance box	Inductance meter	1	100	mH	Frequency	1 kHz	1	mH/H	2	95%	Yes	128b
Inductance: meters	Inductance meter	Inductance standards	0.1	100	mH	Frequency	1 kHz	0.5	mH/H	2	95%	Yes	129

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty					
Quantity	Instrument or artifact	Instrument Type or Method	Minimum value	Maximum value	units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	100	220	mV	Frequency	10 Hz to 20 Hz	220	µV/V	2	95%	Yes	143
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	100	220	mV	Frequency	20 Hz to 50 kHz	70	µV/V	2	95%	Yes	144
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	100	220	mV	Frequency	50 kHz to 100 kHz	200	µV/V	2	95%	Yes	145
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	100	220	mV	Frequency	100 kHz to 300 kHz	300	µV/V	2	95%	Yes	146
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	100	220	mV	Frequency	300 kHz to 1 MHz	1200	µV/V	2	95%	Yes	147
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	0.22	220	V	Frequency	10 Hz to 20 Hz	200	µV/V	2	95%	Yes	148
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	0.22	220	V	Frequency	20 Hz to 50 kHz	50	µV/V	2	95%	Yes	149
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	0.22	220	V	Frequency	50 kHz to 100 kHz	100	µV/V	2	95%	Yes	150
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	0.22	220	V	Frequency	100 kHz to 300 kHz	200	µV/V	2	95%	Yes	151
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	0.22	220	V	Frequency	300 kHz to 1 MHz	1000	µV/V	2	95%	Yes	152
AC voltage up to 1000 V: sources	Multifunction calibrator	Automated AC measurement standard	220	1000	V	Frequency	40 Hz to 20 kHz	100	µV/V	2	95%	Yes	153
AC voltage up to 1000 V: meters	AC voltmeter	Inductive voltage divider	1	1	mV	Frequency	0.4 kHz to 2 kHz	2	mV/V	2	95%	Yes	154
AC voltage up to 1000 V: meters	AC voltmeter	Inductive voltage divider	10	10	mV	Frequency	0.4 kHz to 2 kHz	0.5	mV/V	2	95%	Yes	155

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty					
Quantity	Instrument or artifact	Instrument Type or Method	Minimum value	Maximum value	units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	100	220	mV	Frequency	10 Hz to 20 Hz	220	µV/V	2	95%	Yes	156
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	100	220	mV	Frequency	20 Hz to 50 kHz	70	µV/V	2	95%	Yes	157
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	100	220	mV	Frequency	50 kHz to 100 kHz	200	µV/V	2	95%	Yes	158
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	100	220	mV	Frequency	100 kHz to 300 kHz	300	µV/V	2	95%	Yes	159
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	100	220	mV	Frequency	300 kHz to 1 MHz	1200	µV/V	2	95%	Yes	160
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	0.22	220	V	Frequency	10 Hz to 20 Hz	200	µV/V	2	95%	Yes	161
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	0.22	220	V	Frequency	20 Hz to 50 kHz	50	µV/V	2	95%	Yes	162
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	0.22	220	V	Frequency	50 kHz to 100 kHz	100	µV/V	2	95%	Yes	163
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	0.22	220	V	Frequency	100 kHz to 300 kHz	200	µV/V	2	95%	Yes	164
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	0.22	220	V	Frequency	300 kHz to 1 MHz	1000	µV/V	2	95%	Yes	165
AC voltage up to 1000 V: meters	AC voltmeter	Characterised AC voltage source	220	1000	V	Frequency	40 Hz to 20 kHz	100	µV/V	2	95%	Yes	166
AC current up to 100 A: sources	Multifunction calibrator	Voltage drop across an ac current shunt	100	100	µA	Frequency	10 Hz to 1 kHz	150	µA/A	2	95%	Yes	167
AC current up to 100 A: sources	Multifunction calibrator	Voltage drop across an ac current shunt	1	1	mA	Frequency	10 Hz to 1 kHz	100	µA/A	2	95%	Yes	168

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty					
Quantity	Instrument or artifact	Instrument Type or Method	Minimum value	Maximum value	units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier
AC current up to 100 A: sources	Multifunction calibrator	Voltage drop across an ac current shunt	10	10	mA	Frequency	10 Hz to 1 kHz	100	µA/A	2	95%	Yes	169
AC current up to 100 A: sources	Multifunction calibrator	Voltage drop across an ac current shunt	100	100	mA	Frequency	10 Hz to 1 kHz	100	µA/A	2	95%	Yes	170
AC current up to 100 A: sources	Multifunction calibrator	Voltage drop across an ac current shunt	1	1	A	Frequency	10 Hz to 1 kHz	250	µA/A	2	95%	Yes	171
AC current up to 100 A: meters	AC ammeter, multimeter	Characterised AC current source	100	100	µA	Frequency	10 Hz to 1 kHz	200	µA/A	2	95%	Yes	172
AC current up to 100 A: meters	AC ammeter, multimeter	Characterised AC current source	1	1	mA	Frequency	10 Hz to 1 kHz	150	µA/A	2	95%	Yes	173
AC current up to 100 A: meters	AC ammeter, multimeter	Characterised AC current source	10	10	mA	Frequency	10 Hz to 1 kHz	150	µA/A	2	95%	Yes	174
AC current up to 100 A: meters	AC ammeter, multimeter	Characterised AC current source	100	100	mA	Frequency	10 Hz to 1 kHz	150	µA/A	2	95%	Yes	175
AC current up to 100 A: meters	AC ammeter, multimeter	Characterised AC current source	1	1	A	Frequency	10 Hz to 1 kHz	400	µA/A	2	95%	Yes	176
High DC voltage: high voltage sources	DC kilovolt source	High DC voltage divider	1	10	kV			25 to 100	µV/V	2	95%	Yes	177
High DC voltage: high voltage meters	DC kilovoltmeter	High DC voltage source	1	10	kV			200	µV/V	2	95%	Yes	178
AC high voltage: sources	High voltage AC source	High AC voltage divider	1	7	kV	Frequency	40 Hz to 60 Hz	2	mV/V	2	95%	Yes	179
AC high voltage: meters	High AC voltage meter	Comparison	1	7	kV	Frequency	41 Hz to 60 Hz	3	mV/V	2	95%	Yes	180

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Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty					
Quantity	Instrument or artifact	Instrument Type or Method	Minimum value	Maximum value	units	Parameter	Specifications	Value	Units	Coverage Factor	Level of Confidence	Is the expanded uncertainty a relative one?	NMI Service Identifier
Phase angle: sources	Signal generator, multifunction calibrator: phase	Phase meter	0	2π	rad	Frequency	50 Hz to 6 kHz	1	mrad	2	95%	No	181
Phase angle: sources	Signal generator, multifunction calibrator: phase	Phase meter	0	2π	rad	Frequency	6 kHz to 50 kHz	2	mrad	2	95%	No	182